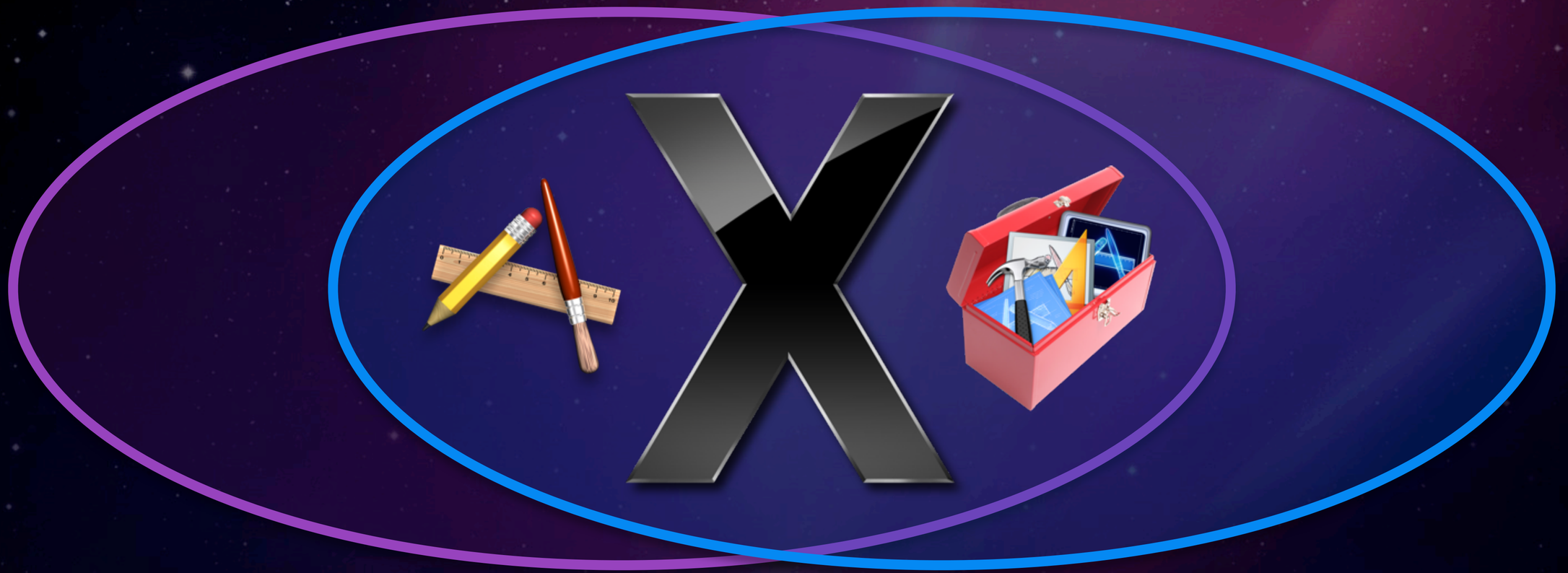
Sessions Kickoff

Bertrand Serlet

SVP, Software Engineering

Mac OS X
Snow Leopard

3.0

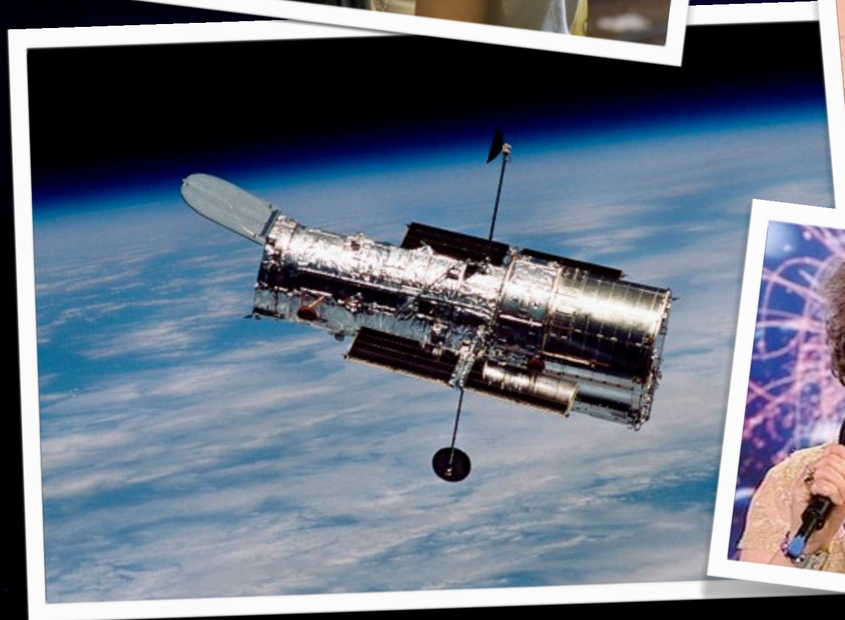


MacBook Air

3G
9:42 AM
Messages
Calendar
Photos
Camera
YouTube
Stocks
Maps
Weather
Voice Memos
Notes
Clock
Calculator
Settings
iTunes
App Store
Phone
Mail
Safari
iPod

60% First Times

New and Different



Big Constants

Bud Tribble

VP, Software Technology

What's Changed Since Last Year?

- iPhone Landscape
- Mac Landscape
- New Technologies

iPhone Has Changed the Landscape

One Billion Downloads

Diverse Development Community

Large Traditional Developers

Game Developers

Small "Garage" Developers

IT Groups

Non-Traditional Consumer Companies

Mac Is Mainstream

Mac Is Mainstream

MS Office

File and Print

MS Exchange

Active Directory

Windows Apps

New Technologies

New Technologies—iPhone

Location

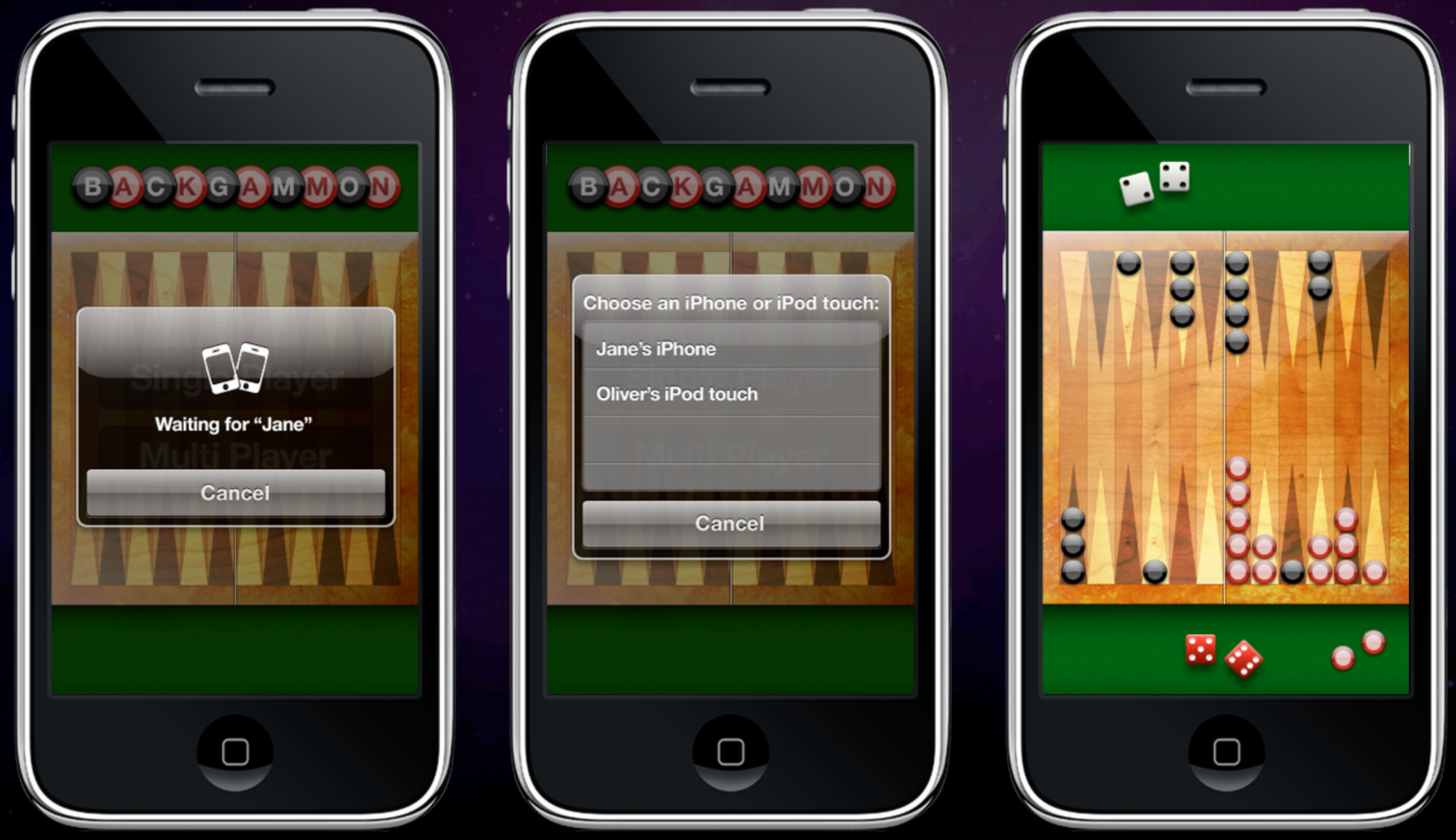
Peer To Peer

Push Notification

Location

ZipCar

Peer To Peer
Backgammon



Push Notification

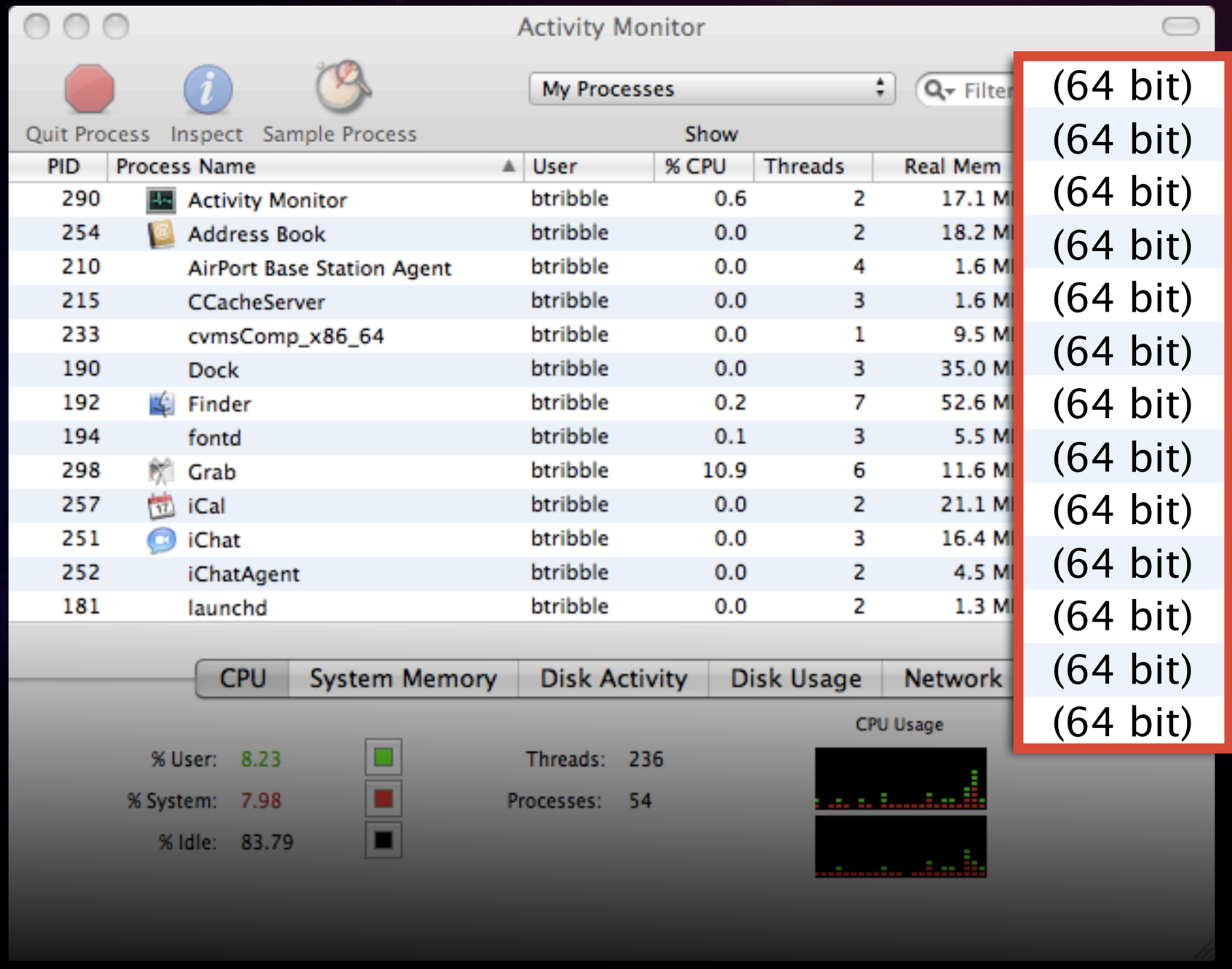
Airstrip—ICU

New Technologies

New Technologies—Mac

64-bit

64-bit


Activity Monitor
Quit Process
Inspect
Sample Process
My Processes
Show
Filter
PID
Process Name
User
% CPU
Threads
Real Mem
290 Activity Monitor btribble 0.6 2 17.1 M
254 Address Book btribble 0.0 2 18.2 M
210 AirPort Base Station Agent btribble 0.0 4 1.6 M
215 CCacheServer btribble 0.0 3 1.6 M
233 cvmsComp_x86_64 btribble 0.0 1 9.5 M
190 Dock btribble 0.0 3 35.0 M
192 Finder btribble 0.2 7 52.6 M
194 fontd btribble 0.1 3 5.5 M
298 Grab btribble 10.9 6 11.6 M
257 iCal btribble 0.0 2 21.1 M
251 iChat btribble 0.0 3 16.4 M
252 iChatAgent btribble 0.0 2 4.5 M
181 launchd btribble 0.0 2 1.3 M
CPU
System Memory
Disk Activity
Disk Usage
Network
% User: 8.23
% System: 7.98
% Idle: 83.79
Threads: 236
Processes: 54
CPU Usage
(64 bit)
(64 bit)
(64 bit)
(64 bit)
(64 bit)
(64 bit)
(64 bit)
(64 bit)
(64 bit)
(64 bit)

64-bit Security Benefits

Harder to exploit ABI

No-execute heap

Stronger heap checks

Grand Central Dispatch

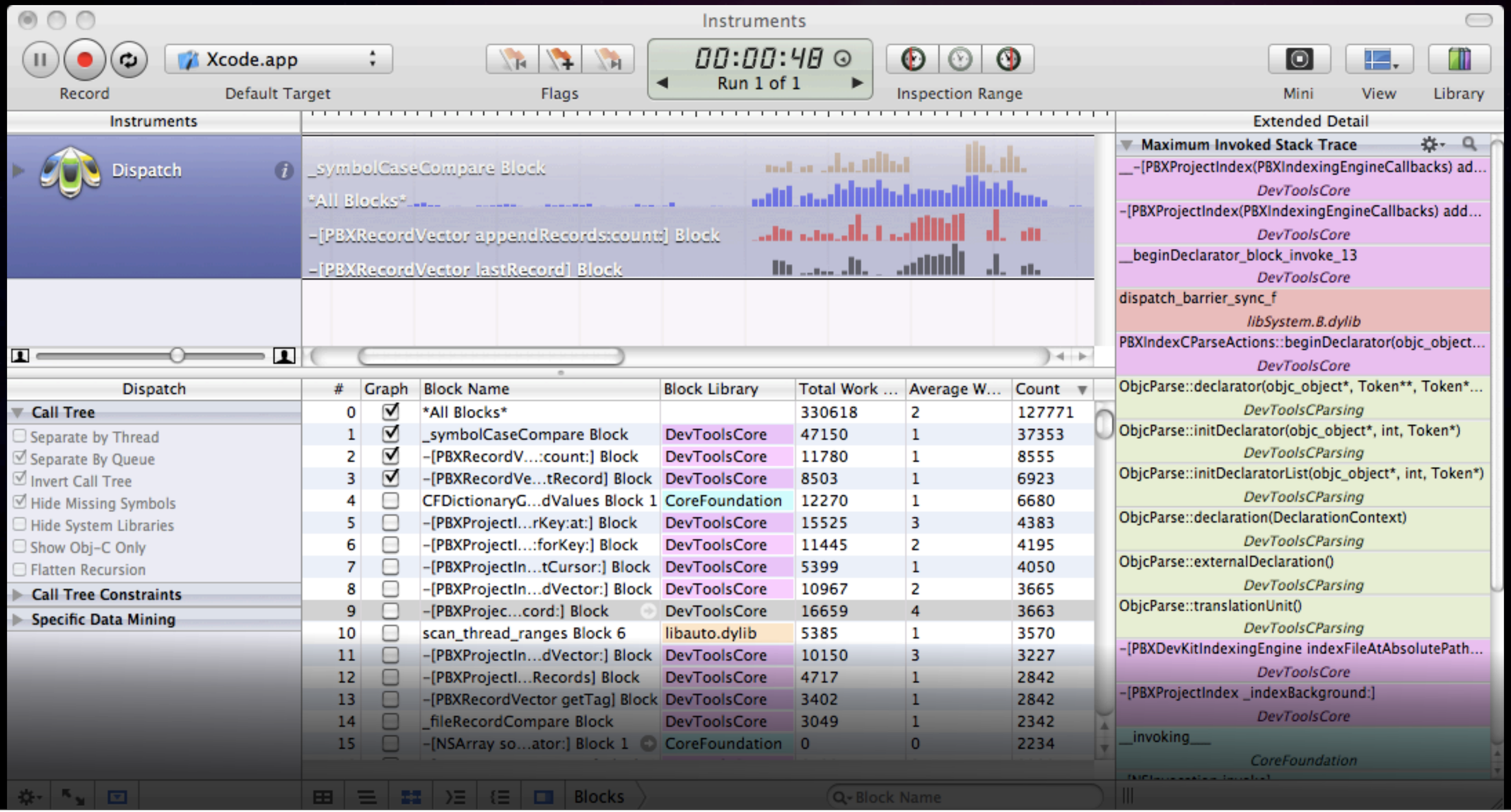
Grand Central Dispatch

Terminal — top — 88×23

```
Processes: 57 total, 2 running, 55 sleeping, 272 threads                 22:38:28
Load Avg: 1.62, 1.28, 0.66  CPU usage:    r, 6.66% sys, 85.23% idle
SharedLibs: 6212K resident, 4804K data,   edit.
MemRegions: 6583 total, 277M resident,    ate, 193M shared.
PhysMem: 431M wired, 507M active, 104M    , 1043M used, 1004M free.
VM: 141G vsize, 1035M framework vsize,     pageins, 0(0) pageouts.
Networks: packets: 1761/1780K in, 1275/   .
Disks: 13648/595M read, 16002/290M writ

PID   COMMAND      %CPU  TIME     #T    #WQ  #POR #MRE RPRVT  RSHRD  RSIZE  VPRVT
91    Finder       0.5   00:02.63 15    10   242  272  11M    33M    34M    39M
191   Grab         10.4  00:00.33 6     4    118+ 170+ 2248K- 25M+   12M+   -242M+
26    mds          0.0   00:01.34 5     3    95   333  46M    3396K  32M    172M
111   CCacheServer 0.0   00:00.02 3     2    37   54   624K   244K   1632K  41M
213   quicklookd   0.0   00:00.09 6     2    80   70   2048K  4448K  5256K  542M
184   WebKitPlugin 0.0   00:00.00 2     2    28   51   516K   244K   904K   40M
181   Safari       0.0   00:09.80 10    2    151  378  56M    14M    93M    215M
172-  iTunes       0.0   00:02.88 13    2    260  288  15M    17M    33M    48M
113-  usbmuxd      0.0   00:00.00 4     2    31   55   324K   244K   708K   29M
112-  iTunesHelper 0.0   00:00.15 4     2    64   89   844K   2020K  2224K  31M
107   AirPort Base 0.0   00:00.01 4     2    34   52   676K   244K   1672K  31M
101   UserEventAge 0.0   00:00.22 4     2    172  115  1892K  1544K  5248K  41M
96    fontd        0.1   00:00.40 3     2    84   98   1956K  6976K  3200K  31M
```

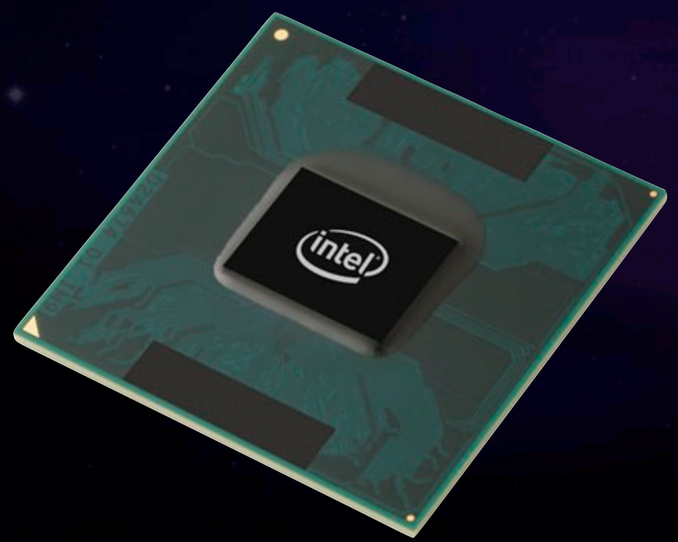
Grand Central Dispatch



OpenCL

OpenCL

```
device = CL_DEVICE_TYPE_GPU;
context = clCreateContextFromType(device);
```




```
device = CL_DEVICE_TYPE_CPU;
context = clCreateContextFromType(device);
```

Demo

Software Bisque
Richard S. Wright

New Technologies

What's Changed Since Last Year?

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What's Changed Since Last Year?

- iPhone Landscape
- Mac Landscape
- New Technologies

Some Big Constants

Structure
APIs
User Experience

Structure
APIs
User Experience

Applications

Frameworks

Graphics

Unix

Applications

Frameworks

Graphics

Unix

Applications

Frameworks

Graphics

Unix

Mac OS X Sources

532,514 files

36,157,184,266 bytes

3B Base-pairs ~ 1GB

Applications

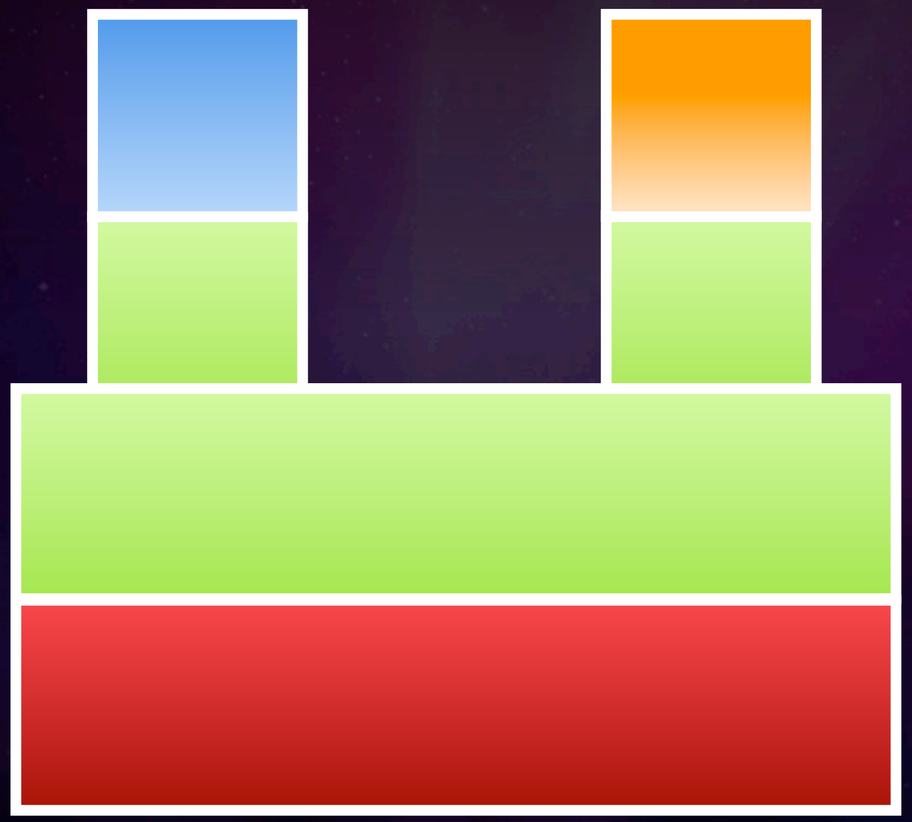
Frameworks

Graphics

Unix

Pattern #1: Split

Pattern #2: Abstract



Pattern #3: Quarantine

Applications

Frameworks

Graphics

Unix

Structure
APIs
User Experience

Structure
APIs
User Experience

Applications
Frameworks
Graphics
Unix

ap•pli•ca•tion pro•gram•ming in•ter•face (abbr. **API**) \ a-pe-i \ *n* computing **:** a system of tools and resources in an operating system, enabling developers to create software applications

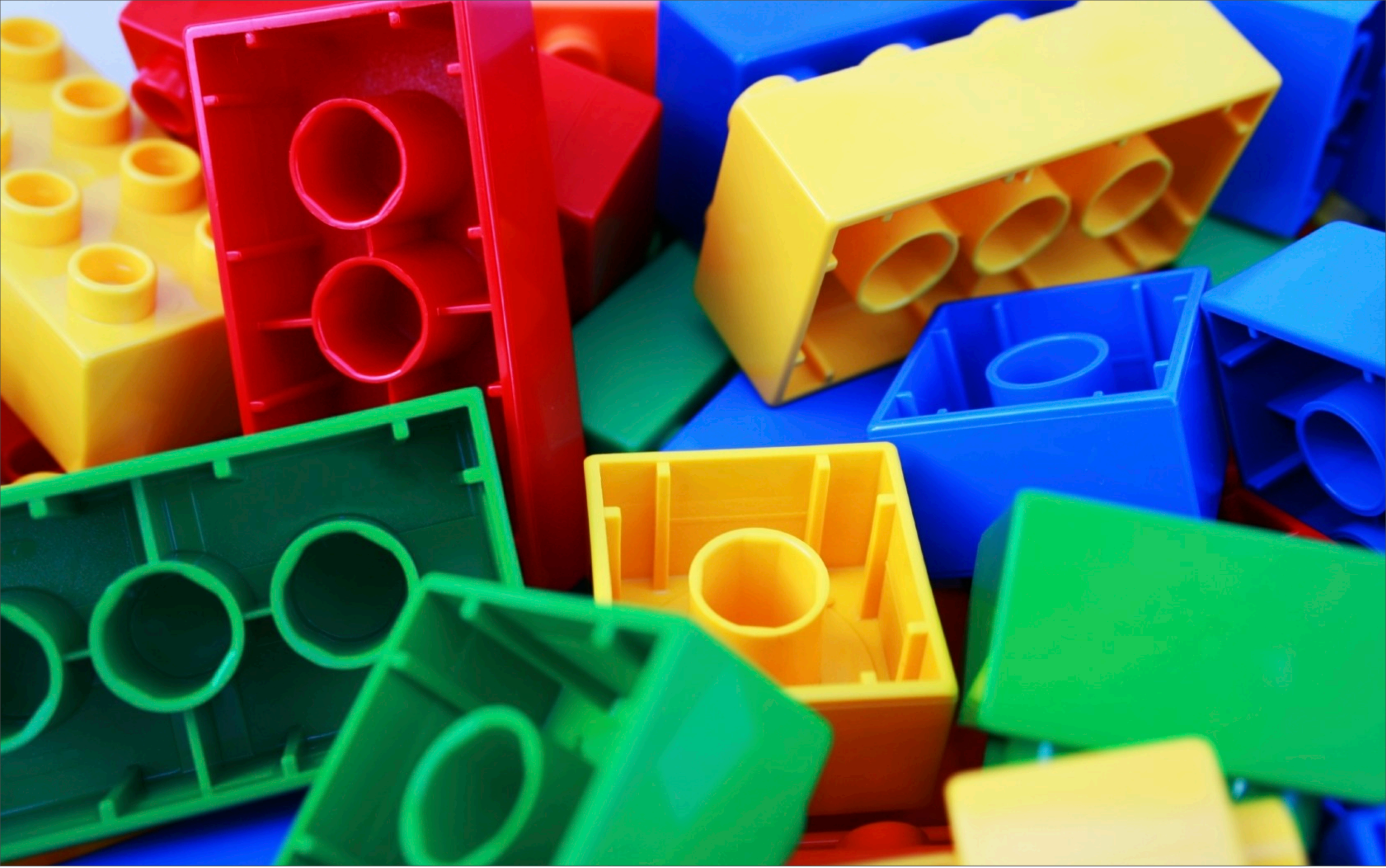
syn.: Header files, Documented APIs, Public APIs

api•an \ a-pe-en \ *adj* [L *apianus*, fr. *apis*] **:** of or relating to bees

api•cal \ ap-i-kel, a-pi\ *adj* [prob. fr. NL *apicalis*, fr. L *apic-*, *apex*] : of, relating to, or situated at an apex — api•cal•ly \ -k(e)le\ *adv*

apiece \a-pes\ *adv* **:** for each one **:** individually

ap•ish \a-pish\ *adj* : resembling an ape: as



Objective C

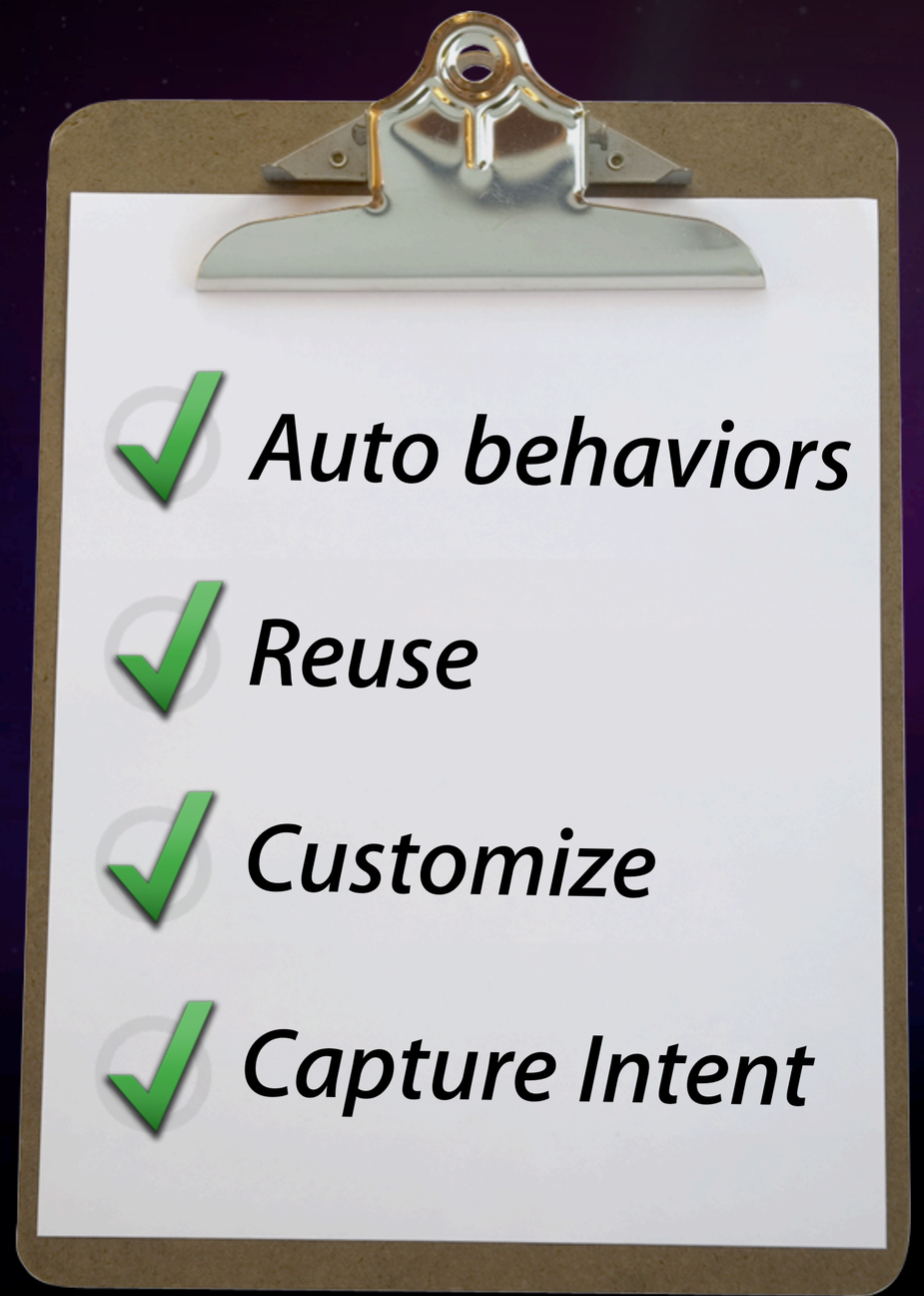
Classes - Methods

Runtime

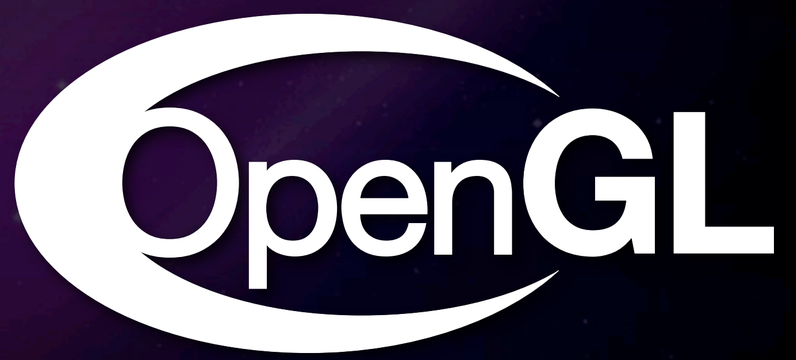
C

Cocoa + Cocoa Touch

Object Orientation



Longevity



40 years

20 years

15 years

API Lifecycle

AppKit
CoreData

CoreAnimation
Foundation

Cocoa Touch
CoreLocation

Structure

APIs

User Experience

Structure
APIs
User Experience

AT&T 3G
9:42 AM
Cancel
Add Alarm
Save
Repeat
Never
Sound
Marimba
Snooze
ON
Label
Alarm
7 41
8 42 AM
9 43 PM
10 44
11 45

Searching "This Mac"
Italy
Searching "This Mac"
Search: This Mac "Macintosh HD" Shared Contents File Name Save
DEVICES
iDisk
Macintosh HD
Backup
SHARED
Leo's MacBook
Aki's Mac mini
Bea's MacBook
All...
PLACES
Desktop
liam
Applications
Documents
SEARCH FOR
Today
Yesterday
Past Week
All Images
All Movies
All Documents
OUR ITALIAN ROAD TRIP
Our Italian Road Trip
Keynote Document
Name
Kind
Last Opened
Florence.jpg JPEG Image September 16, 2007, 10:02 AM
Alcove in Florence JPEG Image September 22, 2007, 2:41 PM
Sam and Daniel.jpg JPEG Image September 30, 2007, 2:40 PM
Our Italian Road Trip Keynote Document Yesterday, 2:26 PM
Statues Standing Guard JPEG Image Yesterday, 7:18 PM
Backup ▸ Documents ▸ Projects ▸ Our Italian Road Trip
1 of 35 selected
September 2007
Yesterday
Today
Now
Cancel
Yesterday at 10:50 AM
Restore

Structure

APIs

User Experience

Structure
APIs
User Experience

iPhone Has Changed the Landscape

Mac Is Mainstream

280

1

64

G
C
D

OCL

Two Sister Platforms

A Large Market

+

Over 70 million

The Ball Is in Your Court